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RESEARCH PAPER

Perceived Applicability of Educational Management Information System [EMIS] in Secondary Schools using the TOE Framework

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ABSTRACT

The utility of information communication technologies [ICTs] in educational planning and management has rapidly increased due to its efficiency and effectiveness. This descriptive study is, therefore, mainly focused on comprehensive analysis of the applicability of EMIS in secondary schools in fulfilling its objectives as perceived by head teachers, using the technology, organization, and environment (TOE) framework as a guideline. A self-developed questionnaire was designed on a 5-point scale, comprising five factors with 37 close-ended items, was administered to head teachers, all 1704 secondary school head teachers' from 11 districts of Southern Punjab constituted population. Four hundred and twenty-six (i.e., 25% of the population) secondary school head teachers (246 male, 180 female), representing both urban and rural areas, were randomly selected using proportionate stratified random sampling technique and 322 participants (76% of sample) finally responded. Both descriptive and inferential statistics were utilized to analyze the data. Results revealed that EMIS was perceived certainly useful to enhance administrative performance of secondary school head teachers. This study, however, recommended for the top and middle level management to provide the required human and financial resources to secondary schools for effective utilization of EMIS data.

Introduction

The utility of ICTs in educational planning and management has rapidly increased due to its efficiency and effectiveness. EMIS is a process of gathering educational statistics with use of emerging information technologies by following

certain procedures, rules, and regulations. Organization of EMIS, according to Santana, Ahumada and Magana(2013), "involves collection, processing, storage, retrieval, analysis and dissemination of data". It was initiated in several countries in early 1980s for the purpose of computing the annual school census as well as for satisfying other administrative needs (Cassidy, 2006). During initial stages, main purpose of developing and using software was only to improve the efficiency of school office activities (Shah, 2014) and the professional approach to systems' design was not widespread (Visscher, 1996).

Educational institutions mainly used computers and information technologies simply to store personnel and student data (Carnoy, 2004) rather than focusing upon transferring or analyzing data (Shah, 2014). In the 1990s, the emphasis on using ICT to collect educational data and to improve administration of educational systems began to increase in developing countries (Shah, 2014).In the context of this changing international scenario and considering the significant role of EMIS in supporting the delivery of quality education, Pakistan also initiated the compilation of education statistics in an automated environment in early 1980s (Zaidi, 2003).Later, National Educational Management Information System [NEMIS] was established in early 1990sand numerous diverse initiatives were brought together to develop a system for computerization of educational data at national level (Academy of Educational Planning and Management [AEPAM], 2003a; Zaidi, 2003). Later, Ministry of Education [MOE] developed EMIS units in all the four provinces of Pakistan along with FANA, FATA and AJK (Zaidi, 2003) with the sponsorship of donor agencies (AEPAM, 2003a).In 2001, the concept of micro planning was introduced by the Government of Pakistan in the context of the devolution of power and Education Sector Reform [ESR] programs (Zaidi, 2003). Consequently, provincial/regional EMIS unitswere decentralized down to district, tehsil and/or circle level. Key objective of this decentralization was to provide timely and accurate data to all the stakeholders (AEPAM, 2003b; Government of Balochistan, 2003) from strategic planners to the operational decision-makers.

In this view, several training projects were initiated for institutional capacity building as well to enhance the data management competencies of the staff to support EMIS units in better planning and decision making (AEPAM, 2003a; 2003b). For example, AEPAM with the assistance of ED-Links and USAID arranged EMIS working sessions regarding internal assessment of existing EMIS infrastructure in Pakistan and emphasized on development of internet communication system among all EMIS units for timely availability and utilization of ensuing data. Despite huge efforts, EMIS units at all levels are still suffering from serious capacity constraints regarding infrastructure, qualified professional staff and financial as well as human resources (Government of Pakistan, 2002; Lacey & Ahmad, 1997). Even District EMIS Cells lack proper networking and computing infrastructure, required skilled staff and sufficient facilities for data processing (LeBlanc & LeBlanc, 2004) along with coordination among provinces and district EMISs (Nafey, 2004; UNESCO, 2005).

The key rationale behind this research paper is that several countries across the globe including Pakistan are spending a lot of resources to establish EMISs for assessing the impact of educational inputs as well as to decide about allocation of resources accurately at all levels of education. A number of scholars have reported about effectiveness of EMISs in supporting institutional planning at higher education level (Echeverría et al., 2012; Indrayani, 2013) and also examined its execution process along with the policy issues related to its implementation (Zaidi, 2003). However, none of the literatures have discussed about usefulness of EMIS particularly from perspectives of secondary school head teachers. This area needs to be explored, specifically in context of distant geographical location of public secondary schools in Southern Punjab where access to educational information is quite difficult. Hence, this study mainly focused on determining the extent of usefulness of EMIS in enhancing administrative performance of secondary school head teachers with a view of examining availability of infrastructure, ease of functioning, challenges faced by head teachers and its effectiveness in managing school activities. It is assumed that EMISs are working appropriately in all schools, the operation of schools is flowing smoothly, and utilization of ensuing EMIS data gives high performance of schools.

The study may be helpful in assisting the decision makers in the improvement of EMIS at secondary school level with key intention of enhancing the performance of system. The study may also assist decision makers at various levels of administration for evaluation, monitoring and planning of the education system. Furthermore, the study may facilitate educational administrators to analyze the issues about problems and weaknesses in the EMIS.

Literature Review

There is substantial literature about usefulness of EMIS in education and its benefits for planning and delivery of educational services. Studies have been conducted to determine the effectiveness of EMIS in education as well as to examine and identify the challenges faced by educational managers. Appropriate and efficient information systems also make educational planning cost-effective (Cuartero & Role, 2018); enable countries to assess the impact of educational inputs as well as to decide about allocation of resources accurately (UNESCO, 2015). A well-executed EMIS provides valuable information for analyzing existing situation of education system as well as operational educational plans (McHugh, 2005). EMIS also assists policy makers in managing an education system efficiently and helps in producing quality outputs only when established by a clear vision and led through strategic planning (Cuartero & Role, 2018). Undoubtedly, several countries across the globe have spent hugeamount of resources to establish EMISs but unfortunately, most of these countries have not institutionalized these systems. Moreover, these systems lack a guiding vision and/or not integrated into "strategic planning processes" (Cuartero & Role, 2018). Writing in same vein, Chapman (2002) argues

that educational managers are not fully aware and skilled about optimum use of available information.

EMIS is a program that integrates all the information related to educational planning and management activities which are available from various sources (Santanaet al.,2013). EMIS also provides necessary information to all three layers of educational management i.e., top level, middle level, and the lower level management (Aldarbesti & Saxena, 2014) and facilitates managers in rational decision-making (Carrizo, Sauvageot & Bella, 2003; Shah, 2003) regarding planning and delivery of educational services. The lower level management utilizes this information in operational decision-making, the middle level management in tactical decision-making while top level management utilizes it for strategic decisions (Aldarbesti & Saxena, 2014). The updated and systematic data provides clear direction to the lower level management about what is to be achieved by the institution and how to achieve it while relying on available information. Abdul-Hamid (2014) argued that a comprehensive EMIS not only includes administrative and student data, but it also provides information to school managers regarding financial and human resources along with learning outcomes.

Furthermore, EMIS provides clear, relevant, reliable and integrated data required for planning, implementation, monitoring and evaluation of various school operations (Cuartero & Role, 2018). An effective EMIS, according to Shooebridge (2015), is essential to evaluate progress towards policy goals. It assists school managers in policy development, budgetary decisions as well as monitoring and evaluation. Cassidy (2006) asserts that EMIS provides the recognizable proof of especially well performing units with the goal that good practices can be exchanged with the inadequately performing units for improvement. Similarly, Soh (2000) claims that EMIS is a powerful system for improving administrative performance of educational mangers at all levels. It supports decision makers to discover challenging areas, decreases operational expenses and presents an efficient way for solution of problems and challenges. Moreover, EMIS provides factual data to school managers for proper allocation of limited resources particularly in the developing countries (UNESCO, 2006).

Theoretical Framework

The intent of this study was to determine the usefulness of EMIS in satisfying administrative needs of secondary school head teachers in Southern Punjab. This study also examined the current efforts and desires to make EMIS successful at secondary school level. This study is based on Technology, Organization and Environment [TOE] model (Tornatzky & Fleisher, 1990) which states that three contexts (i.e., technological, organizational and environmental) influence technological innovation. This model exhibits that technology adoption process is mainly determined by the organizational environment (Chatterjee, Grewal& Sambamurthy, 2002). In these three contexts, 'technological context' deals with innovation and functional equipment of the firms, 'organizational context' with

firm's management using the available technology, and the 'environmental context' is related to the working environment of a firm. Figure 1displays relationship among the TOE framework variables that influence adoption of technological innovation.

This model was initially developed and applied in context of business and industry (Mishra, Konana & Barua, 2007; Zhu, Kraemer & Xu, 2006). But afterward it was widely used for examining diverse types of technological innovations particularly in the context of information technology (Thong, Hong & Tam, 2002), electronic data interchange (Lu, 2010) and technology integration in education (Qadir & Hameed, 2018). This model provides a systematic process for the use of technology in education. In this study, perceptions of the secondary school head teachers about usefulness of EMIS were examined on basis of five factors, using TOE model. These five factors include: the infrastructure to support EMIS, utilization of data, functioning, benefits, and challenges.

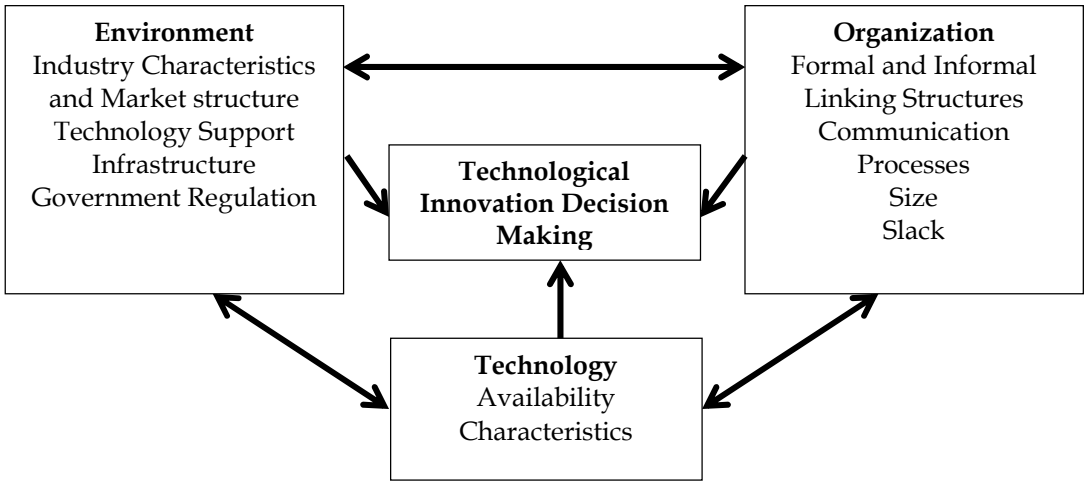

Figure 1: Adopted from Tornatzky and Fleischer (1990)

Infrastructure includes the physical facilities needed for smooth management of EMIS i.e., hardware, software, electricity and internet connectivity. Utilization of data assumes that data should be accessible and utilized for enhancement of institutional efficiency by all head teachers. Furthermore, head teachers should be technically trained to operate system, access and use data, and funds should be available for maintenance of EMIS. Functioning assumes that secondary school head teachers consider EMIS efficient and easy to use as compared to older manual system. They should be able to operate it for improving teaching and learning process. Benefits include usefulness in providing accurate and timely data for setting goals, situational analysis and making policy decisions. Challenges include provision of sufficient human and financial resources along with arrangement of training programs for management of EMIS in schools.

From the perspective of technology, organization and environment [TOE] model, the factors 'infrastructure' and 'functioning' are related to technological context. Utilization and accessibility of data, effectiveness of EMIS, technical training of head teachers and efficiency of EMIS can be studied through organizational context. The head teachers'perceptions about challenges faced by them during management of this system are related to the environmental context of theoretical framework of this study.

Material and Methods

Research Design, Population and Sample

This research was descriptive in nature and quantitative survey design was used. All the 1704 head teachers(985 male + 719 female) serving in 11districts of Southern Punjab constituted the population for this study. The head teachers were selected as they were main data providers in the execution of EMIS as well as preliminary users of subsequent information at lowest management level. Twenty-five percent of whole population i.e., 426 head teachers were selected using proportionate stratified random sampling technique and keeping in view their proportion gender wise, and area wise. Of these 426 head teachers, 246 (i.e., 57.8%) were male and 180 (i.e., 42.2%) were female.

Research Tool

A self-developed questionnaire, comprising two sections, was administered to head teachers to collect data. First section asked respondents to provide demographic information. The second section containing 37 closed-ended items divided in five factors was designed on Likert 5-point scale to elicit views of head teachers about usefulness of EMIS. First factor included nine items to measure availability of infrastructure, second factor with six items measured perceptions of head teachers about the functioning of EMIS, third factor contained 11items to measure the extent of utilization of EMIS data, the fourth factor having six items measured the benefits of EMIS, while final factor comprising five items explored challenges faced by head teachers during process of data management and utilization. The questionnaire was found to be reliable with Cronbach's Alpha reliability value of 0.74.

To determine the validity of the questionnaire, it was ensured that all the five factors of the scale as well as all the 37 items explored the views of participants about all the essential dimensions of EMIS. Furthermore, the relationship among these five factors was calculated to determine validity of the whole scale and presented in Table 1.

Table 1
Showing Factor-Matrix Correlation between Five Factors of the Whole Scale

Factor no.	Factor	Infrastructure	Functioning	Utilization	Benefits	Challenges
F1	Infrastructure	1.000				
F2	Functioning	.139*	1.000			
F3	Utilization	.302**	.035	1.000		
F4	Benefits	.062	.752**	.256**	1.000	
F5	Challenges	.248**	.141*	.240**	.461**	1.000

*. *Correlation is significant at the 0.05 level (2-tailed).*
**. *Correlation is significant at the 0.01 level (2-tailed*).

Table 1 portrays the inter-correlation among all the five factors of the questionnaire computed by applying Spearman co-efficient of correlation formula. Table 1 further shows that the 'r' values for six pairs of factors, namely: (F1 & F3), (F1 & F5), (F2 & F4), (F3 & F4) and (F3 + F5), (F4 & F5) were relatively higher (between .240 and .752). This shows significant positive correlation of the F1 'infrastructure' with F3 'utilization' and F5 'challenges'. Similarly, F4 'benefits' is positively correlated with F2 'functioning' and F3 'benefits. The 'r' values for two pairs of factors, namely: (F1 & F2), (F2 & F5) was comparatively lower (between .139 & .141) than the earlier six pairs. However, the 'r' values for remaining two pairs were very low positive (i.e. .035 &.062) Overall, in all the ten cases, the "r" values were positive (between .035 and .752), which indicates moderate level of internal consistency between different factors or components of the scale. It can, thus, be concluded that the instrument was valid to achieve the study objectives, as elements in it, were closely interrelated with one another.

Data Collection and Analysis

After getting consent from respective Chief Executive Officers [CEOs], researchers administered the questionnaire to 426 sample participants personally as well as with the help of colleagues. Three hundred and twenty-two (322) completed questionnaires representing 191 (i.e., 59.3%) male, 131 (40.7%) female, and 203 (63.0%) urban, and 119 (37.0%) rural participants received back which was about 76% of the total sample. Collected data of 322 sample participants were analyzed by calculating the mean, standard deviation and independent sample t-test.

Results and Discussion

Following three sub-sections present the results in response to the key objective and specific research questions.

Participants' Perceptions about Usefulness of EMIS

As mentioned earlier, the 37 statements of the whole scale were divided into five factors i.e., infrastructure, functioning, utilization of data, benefits of EMIS and

challenges. To examine head teachers' perceptions about extent of usefulness of EMIS, the mean scores and standard deviations of each of the 37 statements were computed and factor-wise results were presented in Table 2 to Table 6followed by interpretation.

Table 2
Perceptions of Head Teachers about Availability of Infrastructure

Sr. no.	Statement	Mean	SD
1	Availability of functional computer in office	4.52	0.50
2	Availability of functional internet connection	4.60	0.49
3	Availability of UPS facility	4.43	0.93
4	Availability of printer facility	4.08	0.72
5	Adequate number of experienced/skilled staff	1.93	1.16
6	Technical support from district EMIS	1.54	0.98
7	Availability of required software resources	4.05	1.05
8	Availability of separate room/office for data management	4.42	0.49
9	Adequate access to district/provincial EMIS data	3.89	1.26
	Overall	**3.71**	**0.84**

Table 2 exhibits that the mean values of the two statements related to human resources i.e., availability of skilled staff and technical support are less than 2.00.It indicates that secondary school head teachers are not satisfied with available human resources. Alternatively, mean scores for majority of the statements concerning physical resources (i.e., six) are above 4.00 while the mean value for one statement is slightly less than 4.00, (i.e., 3.89). The high mean scores on these seven statements are indicative of highly positive perception of head teachers regarding availability of physical resources/infrastructure to support EMIS. Overall mean score of 3.71 also supports this result. Consequently, it can be inferred that head teachers believe that necessary infrastructure for proper working of EMIS is available in secondary schools. Table 2 further reveals that the majority values of standard deviation are below 1.00 which shows a higher level of consensus of sample respondents. To analyze head teachers' perceptions about the functioning of EMIS, the mean scores and standard deviations were computed, and the results were presented in Table 3.

Table 3
Perceptions of Head Teachers about Functioning of EMIS

Sr. no.	Statement	Mean	SD
1	Better than manual system	4.68	0.48
2	Clear and understandable	4.09	0.83
3	Easy to operate	4.57	0.86
4	Easy to browse	4.39	0.49
5	Easy to retrieve and utilize data	4.22	1.17
6	Easy to transfer data to district EMIS	4.49	0.69
	Overall	**4.41**	**0.75**

Table 3reveals that mean scores for all the six statements related to functioning of EMIS are above 4.00. These higher mean scores are indicative of highly positive perception of head teachers regarding functioning of EMIS. Overall mean score of 4.41 also supports this result. Consequently, it can be inferred that head teachers believe that functioning of EMIS is easy and user friendly.Table 3 further reveals that the majority values of standard deviation are below 1.00 which shows a higher level of consensus of sample respondents. To analyze head teachers' perceptions about the utilization of EMIS data, mean scores and standard deviations were computed and the results were presented in Table 4.

Table 4

Perceptions of Head Teachers about Utilization of EMIS

Sr. no.	Statement	Mean	SD
1	Maintenance of students' records	4.11	0.92
2	Maintenance of inventory for non-teaching personnel	2.47	1.12
3	Maintenance of inventory for teaching staff	4.38	0.49
4	Maintenance of school budget	4.42	0.49
5	Maintenance of school expenditures	4.57	0.50
6	Preparation of reports about existing facilities	4.15	0.78
7	Preparation of reports about missing facilities	3.79	1.04
8	Preparation of reports about recently retiring employees	4.15	0.78
9	Maintenance of the record about the visits of higher authorities	1.90	0.95
10	Maintenance of school council meetings' record	2.15	1.08
11	Conveying the school data to higher authorities	3.48	0.61
	Overall	**3.60**	**0.75**

Table 4 exhibits that mean scores for majority of statements (i.e., six) are above 4.00 while the mean values for two statements are somewhat below 4.00, (i.e., 3.79& 3.48). These mean scores are indicative of reasonably positive perception of head teachers regarding utilization of EMIS data. Overall mean score of 3. 60 also support this result. Alternatively, mean values for three statements are below 3.00 (i.e., 2.47, 2.15& 1.90) which indicates that EMIS is used only for management of important data but it is rarely used for compiling trivial information as the records of non-teaching staff, repots of visits and meetings' records. It can, therefore, be inferred that head teachers believe that EMIS is useful in performing important managerial responsibilities efficiently.Table4 further reveals that majority values of standard deviation are below 1.00 which shows a higher level of consensus of sample respondents. To analyze head teachers' perceptions about the benefits of EMIS, mean scores and standard deviations were computed and the results were presented in Table 5.

Table 5
Perceptions of Head Teachers about Benefits of EMIS

Sr. no.	Statement	Mean	SD
1	Provides more accurate data	3.98	1.09
2	Helpful in identifying building and classroom requirements	3.58	1.29
3	Worthwhile for equitable distribution of resources	4.09	0.67
4	Beneficial for crafting annual implementation plan	3.75	1.46
5	Assists in introducing new innovations	2.48	1.34
6	Easier mode of reporting to external agencies	3.72	1.14
	Overall	**3.63**	**1.00**

Table 5shows that mean scores for all statements (i.e., five) are between 2.48 and 3.98 while the mean value for only one statement is just above 4.00, (i.e., 4.09). The mean score 2.48 on one statement i.e., EMIS assists in introducing new innovations, is indicative of low level of head teachers' agreement. Alternatively, moderate positive perceptions of participants on the other five aspects show that secondary school head teachers believe that EMIS is beneficial for enhancing their administrative performance. Overall mean score of 3.63 also supports this result. Table 5 further reveals that the majority values of standard deviation are above 1.00 which shows a moderate level of consensus of sample respondents. To analyze head teachers' perceptions about the challenges faced by head teacher during management of EMIS, mean scores and standard deviations were computed and the results were presented in Table 6.

Table 6
Perceptions of Head Teachers about Challenges Faced

Sr. no.	Statement	Mean	SD
1	Availability of technical support to produce consolidated data	3.17	1.29
2	Data dissemination process is delayed from provincial EMIS	3.99	0.98
3	Availability of financial resources	2.91	1.54
4	Provision of skilled staff for data management	3.10	1.42
5	Arrangement of required training to head teachers	3.09	1.21
	Overall	**3.25**	**1.30**

Table 6depicts that mean scores for all the five statements are below 4.00 i.e., between 2.91 and 3.99. These mean scores are indicative of low positive or negative perception of head teachers regarding four dimensions of this factor i.e., availability of technical support, provision of financial resources and training of head teachers required for effective utilization of the EMIS in secondary schools. However, mean value for one negative statement (i.e., delayed dissemination of data) is relatively high. It can be inferred that data assimilation and processing at district EMIS take far too long and as such delay the timely publishing of the annual report which results in delayed data dissemination. Overall mean score i.e., 3.25 also supports these

results. It can be concluded that secondary school head teachers perceive that delayed dissemination of data, lack of adequate funds, shortage of properly trained staff as well as absence of proper computer training facilities are the major challenges being faced by them while managing the EMIS and utilizing the subsequent data. Table 6 further reveals that majority values of standard deviation are above 1.00 which shows moderate level of consensus of sample respondents on these five aspects.

Differences between Head Teachers' Perceptions Based on Gender and School Location

To analyze the differences in head teachers' views regarding the usefulness of EMIS on the basis of their gender i.e., male and female and on the basis of school location/area i.e., urban and rural, independent sample t- test was computed and the results were presented in Table 7 and Table 8.

Table 7
Gender-wise Comparison of Head Teachers' Views

Gender	N	Mean	SD	Df	t	Sig. (2-tailed)
Male	191	139.06	19.70	320	0.29	0.77
Female	131	138.48	14.07			

Table 7 demonstrates that the mean score for the responses of male head teachers about usefulness of EMISis slightly higher than their female counter parts. The p-value of 0.77 (i.e., $p>0.05$) shows that there is not a statistically significant difference between secondary school head teachers' perceptions about the extent of usefulness of EMIS. Both the groups of head teachers equally believe that EMIS is useful for satisfying their administrative needs and also helpful in enhancing their performance.

Table 8
Area-wise Comparison of Head Teachers' Views

Area	N	Mean	SD	Df	t	Sig. (2-tailed)
Urban	203	148.60	21.29	320	7.38	0.000
Rural	119	134.22	13.34			

Table 8 displays that the mean score for the responses of head teachers serving in urban area schools is higher than their rural counter parts. The p-value of 0.000 (i.e., $p<0.05$) shows that there is a statistically significant difference between secondary school head teachers' perceptions based on school location about extent of usefulness of EMIS. Head teachers serving in urban area schools believe that EMIS is more useful for satisfying their managerial needs and more helpful in enhancing their performance.

Discussion

This quantitative survey design study was mainly conducted to examine the usefulness of EMIS for improving administrative performance of secondary school head teachers. A secondary objective of this research study was to analyze head teachers' perceptions about the challenges faced by them during management and utilization of EMIS data. This study revealed that secondary school head teachers believe that EMIS is highly beneficial in terms of providing accurate data and ease of functioning as well as utilization of data for performing various key administrative responsibilities. Considering the optimistic and substantial effect of the available infrastructure eon effective utilization of EMIS data (UNESCO, 2015; McHugh, 2005), the results of this study are highly satisfactory from the perspective of secondary school head teachers.

Moreover, provision of adequate human and financial resources along with timely publishing of the annual report is considered essential across the globe as a vital tool to make EMIS successful, (Cuartero & Role, 2018), to enhance effectiveness of educational management system (Santana et al., 2013), to improve administrative performance and to strengthen policies and practices (Carrizo et al., 2003; Shah, 2003). However, the findings herein suggest that delayed dissemination of data, lack of adequate funds, shortage of properly trained staff as well as absence of proper computer training facility are the major challenges being faced by secondary school head teachers while managing the EMIS and utilizing the subsequent data. These results are aligned well with the findings of Zaidi (2003) who reported that "the provinces have neither the financial resources, nor the human capacity to undertake data migration". Likewise, Shah (2008) concluded that EMISs in Pakistan are generally found deficient regarding human and financial resources at all levels. The results of this study further postulate that data assimilation and processing at district/provincial EMIS take far too long and as such delay the timely publishing of the annual report which results in delayed data dissemination.

Conclusion and Recommendations

The results of this study clearly suggest that secondary school head teachers view usefulness of EMIS as positive, but participants also showed concerns regarding deficient human and financial resources required to manage and utilize the ensuing EMIS data. To be specific, the four main conclusions were drawn in response to four research questions. First, head teachers believe that EMIS is useful in performing important managerial responsibilities efficiently and it also helps in planning, executing and managing routine school activities. Second, head teachers believe that delayed dissemination of data, lack of adequate funds and shortage of properly trained staff as well as the absence of proper computer training facility is the major challenges being faced by them while utilizing the subsequent information from EMIS. Finally, secondary school head teachers serving in urban area schools significantly believe that EMIS is more useful for satisfying their managerial needs and also more helpful in enhancing their performance.

Based on the results of this study, the educational leaders, planners and the managers at district and provincial level may develop strategies to provide needed human and financial resources to secondary schools for effective data management and its utilization. Moreover, training opportunities regarding administration and management of EMIS may be arranged for all head teachers to improve their administrative performance. Finally, it is recommended to facilitate networking systems between schools and education offices to enable data sharing and timely submission and dissemination of information.

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